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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,227	08/03/2006	Tetsuhiro Ishikawa	128935	5418
25944 7590 07/20/2009 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER SLIFKA, COLIN W	
			ART UNIT 1793	PAPER NUMBER
			MAIL DATE 07/20/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,227	Applicant(s) ISHIKAWA ET AL.	
	Examiner COLIN W. SLIFKA	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-9 is/are rejected.
- 7) ☒ Claim(s) 1 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/3/2006 and 5/27/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities: line 4 of Claim 1 recites "comprising a plurality of multi-phases." This is redundant and should read either "comprising a plurality of phases," or "comprising multi-phases." However, to be consistent with the specification and following claims, "plurality of phases" would be better suited. Appropriate correction is required.

Claim 9 is objected to because of the following informalities: line 3 of claim 9 reads "the fuel cell is connected to a secondary to a secondary side..." This appears to be a simple error of repeated words, and one of the "to a secondary" phrases should be removed. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 2 both refer to, in line 3, a "three phase bridge type converter." Because of the word "type," it is not clear what the positive limitations of the claim are. It is not clear if the invention is to be limited to "bridge type converters," "three phase type converters," or any type of converter so long as the converter comprises a "plurality of multi-phases." Examiner has gathered from

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the disclosure and claims that the invention is focused more on the "plurality of phases" and operations of said phases, rather than on the actual type of converter. However, "type" is still ambiguous and the claims need to be amended to provide a positive limitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiura et al (US 2002/0038732) in view of Tsuchiya (JP 2003-235252).

Sugiura teaches a dc power supply using a fuel cell, wherein the fuel cell is connected to a rechargeable/dischargeable battery via a DC-DC converter (par. 7 and Fig. 1).

While Sugiura discloses that the output voltage of the DC-DC converter can be varied (par. 42), Sugiura does not teach that the converter comprises a plurality of phases.

Tsuchiya teaches a method of operating a DC-DC converter, wherein a controller controls a "master" DC-DC converter and "slave" DC-DC converters on the basis of the requested output voltage from the inverter, the input-output current voltage information from the current/voltage sensors, the battery voltage information from the voltage

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sensor, and others (Abstract). More specifically, Tsuchiya teaches that the master DC-DC converter is made to “certainly drive,” and performs adjustment of the number with slave DC-DC converters (par. 27, lines 2-3). The number, N, is a predetermined number based upon several calculations and determines the control method while maintaining maximum efficiency (pars. 21-26). Operation of the various DC-DC converters is based upon the value of the number, N (par. 27, lines 3-6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the converter system of Tsuchiya in the hybrid fuel cell system of Sugiura in order to optimize the operating efficiency where at least one to three different converters can be utilized based on need.

The three converters of Tsuchiya, which are in parallel, are considered to be the equivalent of the three phase converter of the instant invention. In the case that the three phase converter of the instant invention is to be considered as a single, “multioutput” DC-DC converter, rather than 3 separate converters in parallel, it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate the three converters of Tsuchiya into one. In fact, Tsuchiya refers to the three converters as a master slave type DC-DC converter, as label 3 of Figure 1 in the abstract.

Regarding claims 3, 4, 7, and 8, Tsuchiya teaches that if $N=1$, only the master DC-DC converter will be in operation, and if $N=2$, both the master DC-DC converter 31 and the slave DC-DC converter 32 will be in operation, and finally, if $N=3$, the master

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DC-DC converter 31 and both of the slave DC-DC converters 32 and 33 will be operational (par. 27, lines 3-6).

With regards to claim 9, the fuel cell of Sugiura is inherently connected to load equipment to power the vehicle. At the very least it would have been obvious to one of ordinary skill in the art at the time of the invention to connect the fuel cell to load equipment because that is how all fuel cells deliver the generated power.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLIN W. SLIFKA whose telephone number is (571)270-5830. The examiner can normally be reached on Monday-Thursday, 10:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLIN W SLIFKA/
Examiner, Art Unit 1793

July 16, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793